important works on Spitsbergen would have enhanced the value of the book to interested readers, who will nevertheless find it the best available compendium of Spitsbergen information.

G. W. T.

THE LEAGUE OF UNIVERSITIES.

A REPRESENTATIVE body of British university men and women spent the autumn of 1918 in America as the guests of the United States. By invitation of the Government of the French Republic a similar delegation visited the universities of France last May. From the Belgian Government an invitation was received and accepted in November. The reports of these three university missions may be obtained from the Universities Bureau, 50 Russell Square, W.C.1. In each of the countries visited the representatives of the United Kingdom were received with profuse hospitality and treated with the utmost consideration by the Head of the State and his Ministers, as well as by the heads of the universities and their professors. In innumerable speeches the general objects of this university "entente" received eloquent and enthusiastic expression, stress being laid upon the necessity, in the interests of the world's peace, of bringing the intellectual leaders of the allied and associated countries into closer and permanent touch. There may be rivalry amongst the universities of the civilised world, but there can be no competition, in the sense in which commercial enterprises compete, with the risk of producing discord. All are engaged upon a common task, the making of knowledge, and the training of men and women for professions and occupations in which learning is the only trustworthy equipment.

During the last three or four years the universities of the United Kingdom have discovered that their power and influence may be greatly strengthened by taking counsel together, without any sacrifice of independence. There is the same need for conference and co-operation amongst the universities of the world. Amongst definite problems discussed was the interchange of teachers and students—the migration of those who dispense and of those who seek knowledge, adjusted to modern conditions. The reports of all three missions are in approximately similar terms. It is recognised that professors who are heads of departments have many administrative duties in addition to their duties as teachers. Their universities cannot spare them for any considerable time, nor can their duties be taken over by strangers. Heads of departments might with great advantage give short courses of lectures in foreign countries, provided the language difficulty can be overcome. Professors of highly specialised or recondite subjects, for which the demand is limited or occasional, might well distribute their services amongst several universities, spending an occasional year abroad.

With regard to migration of students, it is clearly desirable that students of languages should spend a part of their undergraduate career in foreign countries; but with this exception it is almost universally agreed that only in rare instances would it be to the advantage of a student to leave the university in which he is matriculated until after graduation. The first year's work at any one university is not easily articulated to the second year's work at any other. Nor would any university be content to part with its third-year students. For a graduate, every possible facility for migration should be afforded. Even though his new university be not so well equipped for work in the subject to which he is devoted, it is to his advantage that his experience should be enlarged. So far as British universities are concerned, post-graduate study will be encouraged by the new Ph.D. degree which all have now established. The same degree is obtainable in the U.S.A., and its equivalent, the doctorat de l'Université, in France and Belgium.

NOTES.

THE new session of Parliament was opened in state on Tuesday by the King, who was accompanied by the Queen and the Prince of Wales. Among the matters referred to in the King's Speech were a Bill to make further provision for education in Ireland, measures to stimulate and develop the production of essential foodstuffs within the United Kingdom, and to encourage and develop the fishing industry, and Bills providing against the injury to national industries from dumping and for the creation of an adequate supply of cheap electric and water power.

As successor to the late Mr. Henry Watts in the editorship of the Journal of the Chemical Society, and as the first secretary and registrar of the Institute of Chemistry, Mr. Charles Edward Groves, F.R.S., was for many years a very prominent figure in the chemical world. His scientific education was received under Hofmann at the Royal College of Chemistry, where he was contemporary with a group of young men of whom many became distinguished men of science. In October, 1862, Mr. Groves became senior assistant to Dr. John Stenhouse, F.R.S., who had established a private laboratory for research in Rodney Street, Pentonville, and there he remained as factotum until Dr. Stenhouse's death in 1880. He then became lecturer in chemistry at Guy's Hospital. The greater part of Mr. Groves's scientific work was done in the Pentonville laboratory, and was published under the joint names of Stenhouse and Groves, though, in consequence of Dr. Stenhouse's infirmity, the work was mostly done by his assistant. Mr. Groves was a good manipulator and a skilful analyst, and not only assisted in the research laboratory, but for five years also took part in the work of external assayer to the Royal Mint—an office held by Dr. Stenhouse until 1870, when it was abolished. Mr. Groves in his early days was a very active walker and climber in the Alps. For many years he spent his summer holidays in Switzerland, and will be remembered by many of the senior members of the Alpine Club. His death on February 1, at an age approaching eighty years, leaves but few survivors of the original group of students of the Royal College of Chemistry.

THE Carnegie Corporation of New York has announced its intention to give five million dollars for the use of the U.S. National Academy of Sciences and the National Research Council. It is understood that a portion of the money will be used to erect in Washington a home of suitable architectural dignity for the two beneficiary organisations. The remainder will be placed in the hands of the academy, which enjoys a Federal charter, to be used as a permanent endowment for the National Research Council. This impressive gift is a fitting supplement to Mr. Carnegie's great contributions to science and industry. The Council is a democratic organisation based upon some forty of the great scientific and engineering societies of the country, which elect delegates to its constituent divisions. It is not supported or controlled by the Government, differing in this respect from other similar organisations established since the beginning of the war in England, Italy, Japan, Canada, and Australia. The Council was organised in 1916 as a measure of national preparedness, and its efforts during the war were mostly confined to assisting the Government in the solution of pressing war-time problems involving scientific investigation. Re-organised since the war on a peace-time footing, it is now attempting to stimulate and promote scientific research in agriculture, medicine, and industry, and in every field of pure science.

SIR HENRY FOWLER has been elected president of the Institution of Automobile Engineers for the session 1920–21, and Dr. Blackwood Murray, Lt.-Col. D. J. Smith, and Mr. Geo. Watson vice-presidents.

THE National Sea Fisheries Protection Association has decided to form an organisation, to be known as the British Fisheries Guild, with the following objects:—(1) To gather and diffuse information upon all matters relating to fish and fisheries, and to collect and circulate statistics relative thereto; (2) to unite, encourage, and maintain all interests relating to fish and fisheries, and to affiliate local or other organisations with similar objects; and (3) to deal with all questions relative to fish and fisheries, whether scientific or economic in character.

AT the meeting of the Royal Anthropological Institute to be held on February 17 Mr. J. Reid Moir will exhibit and describe certain flint implements and flakes found in the Boulder Clay in pits north of Ipswich and at Claydon. Prof. J. E. Marr is of the opinion that this deposit represents part of the large sheet of Boulder Clay of the Ipswich sheet. Mr. Moir's examination of the form and technique of these implements has led him to the conclusion that they may with probability be referred to the Mousterian phase of culture.

MR. F. H. CARR has just been elected to a seat on the board of directors of the British Drug Houses, Ltd. After holding for several years the Salters' research fellowship, first at the Pharmaceutical Society's research laboratory and afterwards at the Imperial Institute, where he specialised on the active principles of drugs and became a leading authority on alkaloids, Mr. Carr was appointed chief of Messrs. Burroughs Wellcome and Co.'s Chemical Department. In 1914 he was appointed a director of Boots Pure Drug Co., from which position he resigned at the end of the war.

A RADIO Research Board has been established by the Department of Scientific and Industrial Research to co-ordinate and develop researches into wireless telegraphy and telephony at present being undertaken by Government Departments. The members of the Board are:—Admiral of the Fleet Sir Henry B. Jackson, G.C.B., F.R.S., chairman; Comdr. J. S. Salmond, R.N., Lt.-Col. A. G. T. Cusins, C.M.G., Wing-Comdr. A. D. Warrington Morris, C.M.G., Mr. E. H. Shaughnessy, and Prof. J. E. Petavel, F.R.S.—representing the Admiralty, War Office, Air Ministry, Post Office, and Department of Scientific and Industrial Research respectively—and Sir Ernest Rutherford, F.R.S.

ELEANOR ANNE ORMEROD, the distinguished student of economic entomology, lived at Torrington House, St. Albans, from 1887 until her death in 1901, and it was during her residence there that she achieved the final success of her great project to convince the general agricultural public that an accurate knowledge of the life-history of injurious insects was worth having, because it provided the only sure foundation for preventive and curative measures. To commemorate her residence in the county, the Hertfordshire Natural History Society has lately put up a tablet at the gate of Torrington House on Holywell Hill, which will help to keep alive the memory of Miss Ormerod's splendid record of unselfish work.

INFLUENZA is still far from assuming anything approaching an alarming epidemic, although the Registrar-General's return for the week ended January 24 showed a slight increase. In London the deaths were 24, which is rather more than in any week since the commencement of last autumn, but the deaths in the week ended January 31 are nine fewer than in the preceding week. The deaths for the ninety-six great towns of England and Wales, including London, in the week ended January 24 were 85, also the highest in any week since last autumn, but the following week shows a decrease of 19. Both December and January were remarkably mild, which, guided by the weather associated with previous epidemics, is scarcely in favour of lessening an outbreak. So far as can be judged at present, the general health over England and Wales seems highly satisfactory.

JANUARY was very mild over the British Isles with the exception of the first week, when the mean for the United Kingdom generally was nearly 2° F. below the normal. The weekly weather reports issued by the Meteorological Office show that the mean temperature for the second week was, taking the British Isles as a whole, 4° above the normal, and in the third week the excess was 2·3°, whilst for the closing week the excess for the whole kingdom was 1·6°, a deficiency of temperature occurring in Ireland. In each week the rainfall was in excess of the normal over England. The Greenwich records show that the mean temperature was continuously above the average after the first week. The mean for the month was 42·1°, which is 3·6° above the normal for the last thirty-five years; the mean maximum was 4·9° in excess, and the mean minimum 2·1° in excess. There were fourteen days with the thermometer at 50° or above, and on four days the temperature was 55° or above. So far as London is concerned, January was warmer in 1916, when at Greenwich the mean temperature for the month was 3° warmer than January this year; the January mean for 1916 was 45·3°, whilst for 1917 it was 35·3°. In Canada January was abnormally cold, the contrast with the British Isles resembling greatly the winter of 1898–99. For the nine weeks of winter from November 30 to the end of January there was an excess of temperature, and also of rainfall, over the British Isles. The controlling factor was the frequent passage of disturbances from the Atlantic, the centres of which, for the most part, travelled in proximity to Scotland.

THE twelfth annual report of the National Museum of Wales for 1918–19 is a record of steady progress. Considerable advance has been made in the formation of the Welsh portrait and topographical collections, which will in the near future be extensively used for educational purposes and for circulation. The most important accession to the zoological department was the collection of British Lepidoptera and birds' eggs presented by Mr. A. F. Griffith, of Brighton. Specimens, models, and drawings are being collected with the view of forming a Welsh Naval and Military Historical Record, including aviation, which will not be confined to recent years, but will embrace naval and military incidents connected with Wales or in which Welshmen have taken a conspicuous part. The importance of the museum for education in Wales is shown by the use of the collections for special studies in different branches of natural science, and by visits paid by parties of mining students to Cardiff for the purpose. The museum officials do good service in answering inquiries on scientific questions and by identifying specimens submitted for examination.

THE Syndics of the Cambridge University Press have issued a new Catalogue, to which is prefixed an interesting note on the progress of printing in Cambridge. The first printer, John Siberch, settled there in 1521, and eight books have been found bearing his imprint. The modern history of the Press may be said to have begun in 1698, when, thanks to the labours of Richard Bentley, a great revival of typography took place. Additions were made to the buildings, new presses set up, beautiful types imported from Holland, and a body of Curatores Præli Typographici, of whom the Press Syndics of the present day are the successors, was appointed. One of the most famous English printers, John Baskerville, entered into an agreement with the University in 1761. Early in the nineteenth century stereotype plates, the invention of the third Earl Stanhope, were successfully used. In 1824 part of the surplus of the fund for erecting a statue of William Pitt was devoted to the new Press buildings; J. W. Parker (1836–54) was the first to introduce steam-power; and since then under the control of the Clay family—John Clay, the late printer, died in 1916—and of the present printer, Mr. J. B. Peace, the work of the Press has rapidly extended its operations, the result of which is fully illustrated in the new Book Catalogue.

IN the "Historical Collections of the Essex Institute" (vol. lvi., part i., January, 1920) Mr. F. B. C. Bradlee gives an interesting account of the maritime history of Newburyport, Massachusetts. Many famous vessels sailed from this old Essex County city, among the best known of which was the *Dreadnought*, built in 1853, and afterwards celebrated for making the shortest passage across the Atlantic ever accomplished by a sailing vessel—nine days and seventeen hours from Sandy Hook to Queenstown. She was named by sailors the "Wild Boat of the Atlantic," and was a semi-clipper, possessing the merit of being able to bear driving as long as her sails and spars would stand. Mr. Bradlee, in opposition to what he calls "a small coterie in New York," claims to have proved the correctness of the records of this famous voyage of the *Dreadnought* in 1859, and gives a full account of later ships sailing from Newburyport.

IN the issue of the Annals of the Natal Museum for May, 1919 (vol. iv., part 1), a valuable paper is contributed by Mr. Claude Fuller entitled "The Wing Venation and Respiratory System of Certain South African Termites," illustrated by eight folding plates. The author's observations on the development of the wing-veins have been directed towards an investigation of the conclusions of Comstock and Needham. One of the main points wherein he differs from the American authors is in the origin of the wing tracheæ. It is remarked that the tracheæ of the wing-sac develop from two or three buds, arising from the spiracular trunk tracheæ of the meso- and metathorax, and not upon the dorsal and ventral longitudinal trunks, as enunciated in the general scheme of Comstock and Needham. In a recent book by Comstock, "The Wings of Insects" (1918), which apparently was issued while Mr. Fuller's paper was in the press, an article is contributed by Chapman on the basal connections of the wing tracheæ, and it appears that these recent observations are more in accord with those of Mr. Fuller than the earlier American work. It is evident, however, that the origin of the wing tracheæ in termites is less primitive than in some other insects. The remainder of the paper deals with the spiracles and the tracheal system as a whole, together with a study of the venation in the completed wings of various species and of the wide range of variation exhibited therein.

IT is well known that when America was discovered maize was widely cultivated by the aborigines, but the wild source of the plant has remained obscure. Various views concerning its origin have been entertained, one being the theory of Mr. Collins, based on breeding experiments and morphological comparisons, that maize arose as a hybrid between the Mexican teosinte (Euchlæna) and some unknown grass belonging to the Andropogoneæ. Mr. Y. Kuwada in an interesting paper (Journ. Coll. Sci. Imp. Univ. Tokyo, vol. xxxix., art. 10) has studied the chromosomes of maize and its relatives, and brings cytological evidence in support of Mr. Collins's hypothesis. Maize, as well as Euchlæna and Andropogon, is found to have ten pairs of chromosomes, but those of Euchlæna are longer than those of Andropogon, while in maize they are found to be of different lengths, a pair frequently being composed of a longer and a shorter chromosome. From this it is concluded that maize is hybrid in origin, the two types of chromosomes being traceable as in certain experimentally produced animal hybrids. Some races and individuals of sugar-maize are found to have eleven or twelve pairs of chromosomes, which is attributed to cross-segmentation of one or two pairs. It would appear that in the origin of the many known varieties of maize, a considerable number of which were grown by the natives in different parts of the American continent, hybridisation and mutation may have gone hand in hand.

THE United States Department of Agriculture is publishing a folio atlas of American agriculture. Part ix., section i., deals with rural population, and contains thirty black-and-white maps and diagrams based on the census returns of 1910. Among the most interesting maps are two showing respectively the increase and decrease in rural population between 1900 and 1910. Increase was mainly in the Pennsylvania mining district, in the cotton belt, in the newly developing agricultural regions of the west, and around cities. Decrease was most marked in the maize and winter wheat region. It is explained by the consolidation of many small farms into a few large ones in order to secure the full benefit of the use of machinery and large-scale production. The decrease in population in these districts is mainly a measure of their productiveness. Of much interest, too, are the maps showing the distribution of native white, foreign, and negro stocks. For this purpose all people are classed as foreign who either were born abroad or one or both of whose parents were born abroad. A series of maps shows the distribution of foreign population by countries of origin. In both urban and rural populations the Germans are the principal nationality of foreign stock, and the Irish the second. Except in the case of Norwegians, Danes, and Swedes, the foreign element is more noticeable in the urban than in the rural population. A map illustrating the percentage of the rural population unable to speak English shows a high proportion in the west and north, particularly in Wyoming, North Dakota, and Minneapolis, where the Russian and Scandinavian elements are marked, and in Pennsylvania, with its comparatively recent influx of Slavs, Hungarians, Germans, and Italians.

A GOOD geographic account of the Mackenzie River basin has been drawn up by Messrs. C. Camsell and Wyatt Malcolm for the Geological Survey of Canada (Memoir 108, 1919). It has an eminently practical bearing, and should guide those seeking new agricultural lands or new fields for industry in the North-West.

M. L. DE LAUNAY furnishes an important review of the mineral resources of Alsace-Lorraine in the *Revue Scientifique* (November 15, 1919, p. 673). It is interesting to note that this article arose from a lecture given in the recovered town of Metz, which lies at the south end of the great field of oolitic iron-ore. Sketch-maps are given of this field and of the potassium and petroleum areas in the Rhine-vale.

THE importance of algæ in the formation of limestone is further emphasised by the publication of Mr. W. H. Twenhofel's paper on "Pre-Cambrian and Carboniferous Algal Deposits" (*Amer. Journ. Sci.*, vol. xlviii., p. 339, November, 1919). In the massive cases here described it is held that the calcium carbonate does not enter into the tissues of the plant, but is deposited, as in so many recent travertines, by the lessening, through the activity of organisms, of the capacity of the water to retain the salt in solution. The deposits are thus of the nature of laminated encrustations.

THE Monthly Bulletin of the Hawaiian Volcano Observatory, which is always noteworthy for its unique illustrations, gives (in vol. vii., No. 8, August, 1919) a fine picture of a lava-rush in a cave, photographed in June, 1919. The work of observation has been rendered far more interesting for readers of NATURE since the publication of the views of the great topographic model, in which the situation of the scientific station is clearly shown (NATURE of August 7, 1919, vol. ciii., p. 456). Mr. E. S. Shepherd gives a number of analyses of the gases collected from Kilauea in Bulletin No. 7, 1919, showing a "surprisingly high" amount of water.

THE appearance of a memoir of 300 pages on "The Geology of the Country around Lichfield" (Mem. Geol. Survey, England and Wales, 1919, price 9*s.*) makes us once more wish that some relic of the Colby-Portlock plan, hazarded in Ireland in 1840, had been allowed to remain in our Geological Survey organisations. The scheme of the Irish Ordnance Survey was undoubtedly too ambitious for the limitations of public finance, and we now possess adequate unofficial descriptions, from the Victorian county histories down to the compact and clever Cambridge geographies, of the greater part of England. The Lichfield country is fully treated in this memoir from a geological point of view, in continuation of the important modern descriptions of the details of our British coalfields; but we should hail some expansion of Mr. G. Barrow's twelve lines on the "distribution of the population." The broad agricultural landscape, controlled by Triassic strata, that is so well seen from the tower of Tamworth, is bounded on the east and west by busy coalfields. The Roman highway leading to the west undulates upwards to the bleak moor of Cannock, a "chase" long after the days when a king's daughter held Tamworth Hill against the Danes. English history is epitomised in the buildings on this hill, now so well preserved as the municipal museum; and the changes in the density of population, from the making of the Watling Street down to the development of the coal-mines, are largely concerned with geology, and deserve a chapter to themselves.

BOTH botanists and geologists will welcome the second part of the memoir on the remarkable petrified plants from the silicified peat-bed in the Old Red Sandstone of Rhynie, Aberdeenshire, by Dr. R. Kidston and Prof. W. H. Lang, just published in the Transactions of the Royal Society of Edinburgh (vol. lii., No. 24, with 10 plates). The genus Rhynia and a new allied genus Hornea are described in detail and referred to a new family, Rhyniaceæ, of the class Psilophytales. These, and the other vascular Cryptogams preserved with them, are the most ancient plants of which the internal structure and external appearance are adequately known. Rhynia and Hornea have neither leaves nor roots, each consisting merely of an underground rhizome, with long, unicellular rhizoids, and a round aerial stem, dichotomously branched, with sporangia at the ends. They are the simplest known undoubted Pteridophyta, and fundamentally more primitive, not only than all existing land-plants, but also than most of the plants of the Upper Devonian and Carboniferous floras. Their geological age is not later than that of the Middle Old Red Sandstone of Scotland, and an apparently related genus, Sporogonites, occurs in the Lower Devonian of Norway. Several interesting comparisons are made with existing Cryptogams, but the authors wisely defer general conclusions until they have studied more of the associated plants.

THE Report of the Department of Mines of the State of Mysore for the year 1917–18 gives a detailed account of the results of the year's mining operations. Naturally, gold-mining in the Kolar goldfield still forms the preponderating part of the industry; it is satisfactory to find that, in spite of the shortage of skilled labour and the difficulty of obtaining supplies owing to war conditions, there was but little falling-off in the output, the production, amounting to 536,558·72 oz. of fine gold, being only 17,689·71 oz. below that of the previous year. The number of accidents shows an appreciable diminution, and it is interesting to note that the dangerous effects of the rock-bursts, to which this field is liable, have been somewhat prevented by the new methods of supporting the hanging wall by means of packs of waste rock. Of the other minerals produced manganese-ore is the most important; the output of this was 31,331 tons as against 20,674 tons in the previous year. Chrome-ore, magnesite, and asbestos are also produced in small quantities, whilst workings for mica, antimony-ore, corundum, galena, and kaolin are proceeding on what can, for the present, be described as a purely experimental scale.

AMONGST the reports on the mineral resources of the United States recently issued by the Geological Survey of that country one of the most interesting deals with the cement production in 1917. It is there pointed out that the United States produced 93,000,000 barrels in that year, as against a production in Europe of 72,000,000 barrels. An interesting account is also given of the development of concrete shipbuilding. The pioneer concrete ship was a small boat built in France in 1849, followed in 1887 by a small vessel built in Holland. In America the first serious attempt was commenced about 1912, when a number of concrete barges were constructed, until in 1918 the *Faith,* a sea-going vessel of 5000 tons, was launched at San Francisco. It is stated that the percentage of dead-weight to full-load displacement for vessels of 3500-tons dead-weight capacity works out at 52 for concrete, 53 for wood, and 68·6 for steel, so that the capacity of the concrete ship is considerably less than that of the steel ship, although this drawback is to some extent offset by the lower first cost of the concrete ship. Much attention is being paid to this problem in the United States, the design of the steel reinforcement and the production of cement of low specific gravity being in particular closely studied. The report, though brief, contains much information of value to those interested in this modern application of reinforced concrete.

THE annual volume of the Journal of the Scottish Meteorological Society recently published contains papers of considerable interest which should be read by meteorologists on both sides of the Tweed. In the first article Lt.-Col. Gold discusses the relation of meteorology to aviation, and directs attention to the new calls which flying has made on the meteorologist. Thus, for example, visibility and cloud-height, to which little attention was directed in the daily weather service a few years ago, are now of great importance, and provision must be made for such observations in any modern system of reporting to a central office. In another paper Dr. E. M. Wedderburn, who did much to advance the usefulness of meteorology to gunners during the war, states the nature of some of the problems met with in this branch of the subject and of the solutions adopted. In the old days gunners were content to use surface meteorological conditions only in working out their corrections. The introduction of the "ballistic wind" and "ballistic temperature," which take account of the changes of the meteorological elements at all heights traversed by the shell, marks a great step forward. A note by Capt. C. K. M. Douglas shows what valuable information concerning the formation of haloes and similar manifestations may be obtained by flying among the clouds which give rise to the phenomena; while an article by Capt. T. B. Franklin on meteorology and agriculture will appeal to a different class of reader.

THE February issue of *Conquest,* the new popular science monthly, gives, amongst other articles of interest, a *résumé* of the first two of Prof. W. H. Bragg's Royal Institution lectures to children on sound and an article by Dr. Rosenhain on glass. In the latter, which is well illustrated, it is pointed out how serious the consequences of our former neglect of the scientific side of glass-making might have been if we had not set about repairing this fault in the early years of the war. The author describes some of the difficulties which have to be overcome before glass suitable for scientific instruments can be produced. Impurities from the melting-pots and enclosed air-bubbles account chiefly for the large percentage of rejected glass, which may reach 80 per cent. Before the war glass for chemical laboratory use was entirely imported. Our own glass manufacturers have risen to the occasion, and it is to be desired that they should in the future be able to retain a position in the industry.

IT has been known for many years that by treating a photographic plate with a weak solution of a soluble iodide development may be accelerated. In the January issue of the Journal of the Royal Photographic Society S. E. Sheppard and G. Meyer (of the Eastman Kodak Co.) describe some results of their investigations of this action. It seems that the iodide has little or no effect on the action of developers that produce a visible result very soon after their application, but that developers like glycin and hydroquinone, which are slow to produce a visible effect, are much accelerated by it in the early stages of development. With hydroquinone the whole course of development is changed. Ferrous oxalate is not affected by it. The authors suggest that the process of development takes place by the formation of a complex of silver haloid and developer (which then breaks up into metallic silver and oxidation products of the developer), and that the small proportion of silver iodide produced facilitates the formation of this complex. It is well established that silver iodide has a far stronger mordanting action on dyes than silver bromide. Unfortunately for the practical application of the process, the iodide treatment seems always to produce fog.

THE Journal of the British Science Guild for January contains an appeal to members to co-operate more fully in the work of the journal, which is extending its scope. A feature of interest in the present issue of the journal is the series of short editorial notes on topical events, forming a useful supplement to the more detailed accounts of reports, etc., following. A short account is given of the last British Scientific Products Exhibition, and Sir Richard Gregory's address on "Science in Industry," delivered before the Circle of Scientific, Technical, and Trade Journalists at its meeting on the opening day of the exhibition, is reproduced. The report of the Microscope Committee, originally published in the Journal in 1916, is now presented in its revised form. The newly formed Parliamentary Committee, in conjunction with the Agricultural Committee, was instrumental in presenting a memorandum on the Forestry Act, stress being laid on the inclusion, amongst the seven suggested Commissioners, of at least one member having adequate technical and scientific knowledge of the subject. In view of the contemplated legislative measures in regard to deep-sea fisheries, the need for a comprehensive scientific survey of the industry, in order that knowledge may precede legislation, is again pointed out.

THE President of the Board of Education, we note in the Journal of the British Science Guild for January, does not see his way to adopt at once the suggestion of the guild for a consultative committee to advise the Board on matters affecting the relationship of universities and higher technical education to industry, but offers hope that the request may be complied with later. The suggestion conveyed to the Foreign Office that scientific *attachés* should be added to British Embassies and Legations was met by the counter-proposal that technical associations should make their own arrangements to obtain information on foreign developments. The Department of Overseas Trade has issued a circular requesting early intimation of visits to foreign countries by representatives of British firms, in order that consular officers and other officers abroad may be notified. In view of the extensive and valuable work recorded, the appeal being made by the guild for new members and additional funds should meet with generous response. The address of the guild is now 6 John Street, Adelphi, W.C.2.

THE Cammellaird-Fullagar marine oil-engine, constructed by Messrs. Cammell Laird and Co., of Birkenhead, forms the subject of an illustrated article in *Engineering* for January 30. This engine is of the two-cycle type, with two opposed pistons working in the same cylinder, which is open at both ends, and the cycle takes place between the pistons. There are two vertical cylinders in each unit, arranged side by side, and two cranks at 180°. The top piston in each cylinder is connected by inclined rods to the bottom piston of the other cylinder. There are great advantages in this arrangement, among which may be mentioned the saving in space, which is reduced greatly as compared with an ordinary marine four-cycle engine. The opposed piston type has been tried for steam, gas, and petrol engines, and has so far been found wanting. For oil-engines it has several attractive features. There is no cylinder head, and the liner is a single tube free to expand at both ends. Scavenging is simple and effective, since the sweeping-out air enters at the end opposite to that through which the exhaust leaves, and no valves are required to control the scavenging. The piston speed can, in effect, be doubled, due to the compression taking place between the approaching pistons, and thus reducing the most important heat losses during this stroke of the cycle. The turning moment is improved, and stresses are not taken up by the engine framing, but confined to the moving parts of the engine. The test-bed results for the engine under notice are good, and the performances under seagoing conditions will be watched with the greatest interest.

THE latest catalogue (No. 185) of Messrs. W. Heffer and Sons, Ltd., Cambridge, contains the titles of nearly two thousand works, ranging over the subjects of agriculture and husbandry, anthropology and ethnology, botany, chemistry, geology, mineralogy and palæontology, biology, physiology, anatomy and medicine, mathematics and physics, astronomy, and engineering. Some of the volumes were formerly the property of Sir William Crookes and Sir Frank Crisp. In addition to the books referred to, there are for disposal a number of portraits of scientific men.

OUR ASTRONOMICAL COLUMN.

LARGE FIREBALL ON FEBRUARY 4.—In the early evening at 6h. 14m. a splendid meteor was seen from various parts of the country. Among the observers were several persons who have gained experience in recording meteors, so that the real path derived from